CLAIMS

1.   A system to facilitate measurement, comprising:

an article mount adapted to maintain an article comprising a plurality of layers, including an outer skin layer, a core layer and an inner skin layer;

at least one wave energy source arranged to direct wave energy onto the article;

at least one transducer arranged to receive at least a portion of the wave energy reflected from the article and adapted to generate an electronic signal corresponding to the portion of the wave energy; and

a processor electronically coupled to the transducer adapted to process the electronic signal to identify a characteristic shape corresponding to an interface between two of said plurality of layers, and to determine parameters of a killing function.

2.   The system of clam 1, wherein the characteristic shape is harmonic and a first peak corresponds to the first interface.

3.   The system of claim 1, wherein the mount comprises a conveyor to move the article.

4.   The system of claim 1, wherein the wave energy sources is a source of ultrasound.

5.   The system of claim 1, wherein the article mount is adapted to maintain the article in a liquid.

6.   The system of claim 1, wherein the at least one wave energy source comprises a plurality of wave energy source that are arranged in a plurality of levels.

7.   The system of claim 6, wherein the at least one wave energy source comprises four wave energy sources at each level, arranged to project wave energy along two different axes.

8.   The system of claim 1, wherein the at least one wave energy source is adapted to focus wave energy on the core layer.

9.   A method to facilitate measurement of thickness, comprising:

mounting a co-injection article comprising a plurality of layers, including an outer skin layer, a core layer and an inner skin layer;

projecting wave energy onto the article;

receiving at least a portion of the wave energy reflected from the article;

converting the portion of the wave energy to form an electronic signal; and

processing the electronic signal to identify a characteristic shape corresponding to an interface between the layers; and

determining parameters of a killing function.

10.   The method of claim 9, further comprising moving the article on a conveyor prior to the step of projecting.

11.   The method of claim 9, wherein the step of projecting wave energy comprises projecting ultrasound wave energy.

12.   The method of claim 9, further comprising maintaining the article in a liquid during the step of projecting wave energy.

13.   The method of claim 9, wherein the step of projecting wave energy comprises projecting wave energy at a plurality of levels on the article.

14.   The method of claim 9, wherein the step of projecting wave energy source comprises projecting wave energy along two different axes.

15.   The method of claim 9, wherein the step of projecting wave energy comprises focusing the wave energy on the core layer.

16.   The method of claim 9, wherein the characteristic shape is a peak.

17.   The method of claim 16, wherein identifying the peak corresponding to the interface comprises determining major peaks and identifying a peak corresponding to the interface from among the major peaks.

18.   The method of claim 9, further comprising a step of applying the killing function to the electronic signal.

19.   The method of claim 18, wherein the step of applying the killing function includes setting the maximum value of the killing function equal to the maximum value of the peak corresponding to the interface.

20.   The method of claim 18, wherein applying the killing function comprises aligning the killing function with a peak identified as the interface between two of the layers.

21.   The method of claim 9, wherein the article is a three-layer co-polymer article.

22.   The method of claim 21, wherein the layers are a skin layer and a core layer.

23.   The method of claim 18, where the step of applying the killing function includes setting the maximum value of the killing function equal to the maximum value of the peak corresponding to the interface.

24.   The method of claim 9, wherein the killing function is a linearly decaying sinusoid.

25.   The method of claim 24, wherein the parameters include the frequency of a sinusoidal component and a slope of linear decay.

26.   The method of claim 22, wherein the layers are an outer skin layer and an outer surface of the core layer.

27.   The method of claim 23, further comprising a step of finding an interface between the inner surface of the core layer and an inner skin layer.

28.   The method of claim 27, further comprising calculating a distance between the interface between the inner surface of the core layer and the inner skin layer, and the interface between the outer skin layer and the outer surface of the core layer.

29.   A system to facilitate measurement, comprising:

an article mount adapted to maintain an article comprising a plurality of layers, including an outer skin layer, a core layer and an inner skin layer;

at least one wave energy source arranged to direct wave energy onto the article;

at least one transducer arranged to receive at least a portion of the wave energy reflected from the article and adapted to generate an electronic signal corresponding to the portion of the wave energy; and

a processor electronically coupled to the transducer adapted to process the electronic signal by subtracting a summation curve corresponding to a summation of a first characteristic peak and a second characteristic peak from the electronic signal.

30.   A method to facilitate measurement of thickness, comprising:

mounting a co-injection article comprising a plurality of layers, including an outer skin layer, a core layer and an inner skin layer;

projecting wave energy onto the article;

receiving at least a portion of the wave energy reflected from the article;

converting the portion of the wave energy to form an electronic signal; and

summing a first characteristic peak and a second characteristic peak, the first characteristic peak and the second characteristic peak being separated by a first time; and

subtracting the first summation curve from the electronic signal to determine a first error value.

31.   The method of claim 30, further comprising:

summing the first characteristic peak and the second characteristic peak, the first characteristic peak and the second characteristic peak being separated by a second time;

subtracting the second summation curve from the electronic signal to determine a first error value.

generating an error value function; and

calculating an error value function minimum.